REMARKS

Applicant respectfully requests reconsideration of the present application in view of the reasons that follow. Claims 36-65 are pending in this application.

I. Allowance of Claims 40, 41, 43-47, 55, 56, 58, 62, 63, and 65

In section 7 of the Final Office Action, Claims 40, 41, 43-47, 55, 56, 58, 62, 63, and 65 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicant thanks the Examiner for recognizing that Claims 40, 41, 43-47, 55, 56, 58, 62, 63, and 65 are allowable over the cited art. However, Applicant believes that the remaining claims are also allowable over the cited art as discussed below. Thus, Claims 40, 41, 43-47, 55, 56, 58, 62, 63, and 65 have not been rewritten in independent form including all of the limitations of the base claim and any intervening claims.

II. Rejection of Claims 36-38, 42, 48, 49, 51-53, 57, 59, 60, and 64 under 35 U.S.C. § 103(a)

In section 3 of the Final Office Action, Claims 36-38, 42, 48, 49, 51-53, 57, 59, 60, and 64 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent Publication No. 2003/0202468 to Cain *et al.* (Cain 1) in view of U.S. Patent No. 7,281,057 to Cain (Cain 2). Applicant respectfully disagrees because Cain 1 and Cain 2, alone and in combination, fail to teach, suggest, or disclose all of the elements of at least Claims 36-38, 42, 51-53, 57, 59, 60, and 64.

A. Rejection of Claims 36, 51, and 59 under 35 U.S.C. § 103(a)

Independent Claim 1 recites in part:

> calculating a connectivity metric for a plurality of links defining each of a plurality of routes that connect a start node with an end node, ... wherein the calculated connectivity metric for a link of the plurality of links is determined based on the first type of node and the second type of node;

Independent Claims 51 and 59 recite a similar feature.

On page 2 of the Final Office Action, the Examiner states:

> Cain discloses in U.S. Patent No. 7,281,057 that a cluster leader node can serve as an ACTN **if the cluster leader node has high link capacities** (Column 13, lines 34-40). If a cluster leader node has high link capacities, then it will be chosen as the ACTN in the route. The link capacity would be higher and the chances that the route will be chosen will be higher. Cain also discloses in U.S. Patent No. 7,281,057 that if the cluster leader node does not have a high link capacity, then the link capacity will be lower and **the chances that the route will be chosen will be lower** (Column 12, lines 27-32 and Column 14, lines 48-53). Therefore, the metric for a link depends on the first type of node and the second type of node because if the first or second nodes are cluster leader nodes, then they will affect the QoS metric as they will either have a very high link capacity or a very lower link capacity.

(Underlining and bolding added). Applicant disagrees with the Examiner's characterization of Cain 2.

At column 12, lines 27-32 cited by the Examiner, Cain 2 states:

> In either event, once selected the best route may then be stored in a routing cache or table. By way of example, the path metric used to **select the cluster-level route** may be which delivery route includes the least number of cluster leader nodes (i.e., **which one has includes the least number of clusters 12**).

(Underlining and bolding added). Thus, Cain 2 merely states that a path metric in selecting the cluster-level route may be the number of cluster leader nodes in a route which, of course, is a direct indicator of the number of clusters which must be traversed between the destination and source nodes because there is one cluster leader node for each cluster. The number of cluster leader nodes in a route is the same regardless of whether or not the links are only between cluster leader nodes, only between cluster nodes, or based on some number of links between a cluster node and a cluster leader node or any combination of these different types of link connections. Thus, the number of cluster leader nodes in a route does not teach, suggest, or describe a "connectivity metric for a link of the plurality of links ... determined based on the first type of node and the second type of node" (underlining added) as recited in Claims 36, 51, and 59.

At column 13, lines 34-40 cited by the Examiner, Cain 2 states:

> The adjacent cluster target node 25 will preferably be as close in distance to the source cluster 27, and have as a high a capacity, as is possible. Also, it should be noted that a cluster leader node of an adjacent cluster **could also serve as a cluster target node** as well, which may be particularly advantageous **if the cluster leader node has high link capacities**.

(Underlining and bolding added). Thus, Cain 2 merely states that an adjacent cluster target node will preferably have as high a capacity as possible and that a cluster leader node can serve as a cluster target node. Cain 2 additionally states that if the cluster leader node does have a high link capacity (which it may not) this is advantageous. However, it is advantageous that the adjacent cluster target node has a high link capacity whether or not it is a cluster leader node. Nowhere does Cain 2 indicate that any metric is calculated differently because the node is or is not a cluster leader node or because the link is between cluster nodes, between a cluster node and a cluster leader node, or between cluster leader nodes. The capacity is a factor regardless of whether or not the node is a cluster leader node. Thus, Applicant respectfully submits that Cain 2 fails to teach, suggest, or describe a "connectivity metric for a link of the plurality of links ... determined based on the first type of node and the second type of node" (underlining added) as recited in Claims 36, 51, and 59.

At column 14, lines 48-59 cited by the Examiner, Cain 2 states:

> As may be seen in FIG. 2, the various node-level routes along the cluster-level route **may or may not include cluster leader nodes**. In some embodiments, it may be particularly **advantageous** to define the node-level routes to **not include cluster leader nodes where possible**, as this may help alleviate excessive traffic at the cluster leader nodes. The node-level route discovery process could thus include using a metric for each potential route that **signifies whether the route will include a cluster leader node**, and the node requesting the route may then use this metric in its selection process, for example, as will be appreciated by those of skill in the art.

(Underlining and bolding added). Thus, Cain 2 states that a node-level route may or may not include a cluster leader node. In this recited section, Cain 2 conversely states that it may be

advantageous to not include a cluster leader node in a node-level route if possible. To avoid selection of a node-level route that includes a cluster leader node, Cain 2 teaches that a metric can be included to signify if the route includes a cluster leader node or not. Similar to the number of cluster leader nodes in a route, "a metric for each potential route that signifies whether the route will include a cluster leader node" (col. 14, lines 55-56) is the same regardless of whether or not the links are only between cluster leader nodes, only between cluster nodes, or based on some number of links between a cluster node and a cluster leader node or any combination of these different types of link connections. Thus, "a metric for each potential route that signifies whether the route will include a cluster leader node" (col. 14, lines 55-56) does not teach, suggest, or describe a "connectivity metric for a link of the plurality of links ... determined based on the first type of node and the second type of node" (underlining added) as recited in Claims 36, 51, and 59.

Applicant further respectfully submits that the Examiner has mischaracterized Cain 2 in stating that "[i]f a cluster leader node has high link capacities, then it will be chosen as the ACTN in the route." (Pg. 2 Final Office Action). Cain 2 provides no such teaching. Cain 2 merely states that a cluster leader node can serve as a cluster target node, and if the cluster leader node has a high link capacity (which it may not), this is advantageous. (*See* col. 13, lines 34-40). Thus, the Examiner has mischaracterized the teachings of Cain 2.

Applicant further respectfully submits that the Examiner has mischaracterized Cain 2 in stating that a cluster leader node "will affect the QoS metric as they will either have a very high link capacity or a very lower link capacity." (Pg. 2 Final Office Action). Cain 2 provides no such teaching. According to Cain 2, a cluster leader node is selected from the nodes forming a cluster based on a variety of metrics "such as hop count, delay, available capacity, node durability, and/or link durability." (Col. 6, lines 20-22; *see also* col. 5, line 10-col. 6, line 67). Thus, a cluster leader node may have a high link capacity or a low link capacity or any link capacity in between. Available capacity is merely one factor among many that can be used to elect a cluster leader node. Therefore, a cluster leader node will not "either have a very high link capacity or a very lower link capacity" (pg. 2 Final Office Action) as stated by the Examiner.

Applicant further respectfully submits that the Examiner's statement that, the "link capacity would be higher and the chances that the route will be chosen will be higher" (pg. 2 Final Office Action) and "if the cluster leader node does not have a high link capacity, then the link capacity will be lower and the chances that the route will be chosen will be lower" (pg. 2 Final Office Action), if true, is true irrespective of whether or not the node is a cluster leader node. Cain 2 does not distinguish between a link capacity of a cluster leader node or a cluster node. Thus, raising or lowering the chance of selecting a route based on capacity fails to teach, suggest, or describe a "connectivity metric for a link of the plurality of links ... determined based on the first type of node and the second type of node" (underlining added) as recited in Claims 36, 51, and 59.

On page 4 of the Final Office Action, the Examiner states:

> Cain et al [Cain 1] do not specifically disclose wherein the calculated connectivity metric for a link of the plurality of links is determined based on the first type of node and the second type of node.
>
> Cain et al disclose in Table 1 (Section 0048) that available link capacity is the most important QoS parameter in determining the total QoS metric for a potential route. Cain in U.S. Patent No. 7,281,057 discloses that a cluster leader node of an adjacent cluster could also serve as a cluster target node (ACTN), which would be advantageous if the cluster leader node has high link capacities (Column 13, lines 34-40). Furthermore, Cain et al in U.S. Publication No. 2003/0202468 disclose in Figure 9 that a cluster leader node 226 serves as the ACTN in the route to destination node 215. So, the QoS metrics is determined based on the first type of type [node] and the second type of node, because if either type of node is a leader, then it **will have higher link capacities and will be chosen** as the ACTN. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include wherein the calculated connectivity metric for a link of the plurality of links is determined based on the first type of node and the second type of node. One would have been motivated to do so since a cluster leader has higher link capacities and can route packets faster and more efficiently if placed in the route to the destination.

(Underlining and bolding added). Applicant agrees that Cain 1 fails to teach, suggest, or describe a "connectivity metric for a link of the plurality of links is determined based on the first type of node and the second type of node" as recited in Claims 36, 51, and 59. Applicant, however, respectfully submits that the Examiner mischaracterizes Cain 1 and again mischaracterizes Cain 2. Cain 1 states:

> As may be seen in Table 1, in the case of route selection various rankings may be used depending upon the types of routes desired. For example, the column labeled "QoS Bandwidth Path" provides a ranking of five QoS parameters that would be most significant to obtain routes having maximum bandwidth, where 1 indicates the most significant parameter and 5 the least significant. Similarly, the columns labeled "QoS Delay Path" and "Best Effort Path" respectively provide rankings for selecting routes with a least amount of delay or having the best probability of message data delivery using a best efforts approach.

(Para. [0049]; underlining added). Table 1 of Cain 1 indicates that available link capacity is ranked highest to obtain routes having maximum bandwidth (QoS Bandwidth Path) and to obtain routes having the best probability of message data delivery (Best Effort Path). Cain 1 further states that "Table 1 includes an exemplary ranking for adjacent cluster target node designation in the column labeled 'ACTN Node Selection.'" (Para. [0060]). Table 1 of Cain 1 further indicates that available link capacity is ranked highest to select an adjacent cluster target node (ACTN Node Selection). However, available capacity is merely the highest ranked parameter and is not indicated as the only parameter in selecting an adjacent cluster target node. Even if it were, neither Cain 1 nor Cain 2 teach, suggest, or describe a "connectivity metric for a link of the plurality of links ... determined based on the first type of node and the second type of node" (underlining added) as recited in Claims 36, 51, and 59 because neither distinguish between a link capacity of a cluster leader node or a cluster node. The link capacity is used to obtain routes having maximum bandwidth (QoS Bandwidth Path) and to obtain routes having the best probability of message data delivery (Best Effort Path) irrespective of whether or not the link is comprised of a cluster leader node and/or a cluster node.

Therefore, Applicant respectfully submits that Cain 1 and Cain 2, alone and in combination, fail to teach, suggest, or describe a "connectivity metric for a link of the plurality of links ... determined based on the first type of node and the second type of node" (underlining added) as recited in Claims 36, 51, and 59. Therefore, a prima facie case of obviousness has not been established. The remaining claims depend from one of Claims 36, 51, or 59. Therefore, Applicant respectfully requests withdrawal of the rejection of Claims 36-38, 42, 48, 49, 51-53, 57, 59, 60, and 64.

B. Rejection of Claims 37, 38, 52, 53, and 60 under 35 U.S.C. § 103(a)

Claims 37, 38, 52, 53, and 60 recite "the connectivity metric is a number of slave nodes in the sub-network." On page 5 of the Final Office Action, the Examiner states:

> The number of nodes controlled by a cluster leader affects the leader being chosen as the ACTN since according to Table 1 (Section 0048), the available link capacity is the most important QoS parameter in determining the ACTN. The more nodes a cluster leader has, the less link capacity it will have, which will decrease the leader's chance of being chosen as an ACTN in the route. Refer to Sections 0080 and 0084.

(Underlining added). Applicant respectfully disagrees and submits that the Examiner is mischaracterizing Cain 1.

Paragraph [0080] of Cain 1 merely indicates that "[i]f the cluster has less than the limit L_{CL} on the number of nodes per cluster, then the cluster leader node accepts the node in the cluster ... [and] [i]f the cluster leader node cannot accept another member, then it sends a reject message CLREJECT to the node." Thus, Paragraph [0080] of Cain 1 teaches that a maximum number of nodes in a cluster may preclude a node from joining a cluster not that the "number of nodes controlled by a cluster leader affects the leader being chosen as the ACTN" (pg. 5 of the Final Office Action) as stated by the Examiner.

Paragraph [0084] of Cain 1 merely provides "examples of equations which may be used for node association" to allow a node to determine which cluster to join and not to select a cluster leader node. Thus, again, Cain 1 provides no teaching that the "number of nodes

controlled by a cluster leader affects the leader being chosen as the ACTN" (pg. 5 of the Final Office Action) as stated by the Examiner.

Even if Cain 1 taught that the number of nodes controlled by a cluster leader affects the leader being chosen as the ACTN, such a teaching fails to teach, suggest, or describe that "the connectivity metric is a number of slave nodes in the sub-network" as recited in Claims 37, 38, 52, 53, and 60. Therefore, Applicant respectfully submits that Cain 1 and Cain 2, alone and in combination, fail to teach, suggest, or disclose all of the elements of Claims 37, 38, 52, 53, and 60. As a result, Applicant respectfully requests withdrawal of the rejection of Claims 37, 38, 52, 53, and 60 for this additional reason.

C. Rejection of Claims 42, 57, and 64 under 35 U.S.C. § 103(a)

Claims 42, 57, and 64 recite "determining the total connectivity metric of a route of the plurality of routes comprises identifying a maximum connectivity metric of the plurality of links defining the route." On page 3 of the Final Office Action, the Examiner states:

> Referring to the argument of claims 42, 57 and 64 (page 13, line 13 to page 14, line 17): Cain et al disclose that selecting the best path involves calculating the path with the maximum and minimum connectivity metric. This involves calculating the metric for each of the links wherein each link metric is defined by m_L (Section 0053). The maximum and minimum link metrics can be therefore be identified during m_L calculations. Refer to Sections 0054-0056.

On page 6 of the Final Office Action, the Examiner states:

> Referring to claims 42, 57 and 64, Cain et al [Cain 1] disclose wherein determining the total connectivity metric of a route of the plurality of routes comprises identifying a maximum connectivity metric of the plurality of links defining the route. Based on the parameters of Table 1 (Section 0048), the QoS metrics for ACTN node selection is calculated for each potential route. This involves calculating the path with the maximum and minimum connectivity metric. Refer to Sections 0054-0056.

(Underlining added). Applicant respectfully disagrees and submits that the Examiner continues to misconstrue the claim language. Whether or not Cain 1 teaches "calculating the

path with the maximum and minimum connectivity metric," Cain 1 fails to teach, suggest, or describe "identifying a maximum connectivity metric of the plurality of links defining the route" as the total connectivity metric as recited in Claims 42, 57, and 64 with emphasis added through underlining. Calculating a maximum value for a path is not "identifying a maximum connectivity metric of the plurality of links" as recited in Claims 42, 57, and 64.

As stated in Claims 36, 51, and 59 from which Claims 42, 57, and 64 depend, "the calculated connectivity metric for a link of the plurality of links is determined based on the first type of node and the second type of node" (emphasis added through underlining) and "a total connectivity metric for each of the plurality of routes based on the calculated connectivity metric for the plurality of links defining each of the plurality of routes" is determined. According to Claims 42, 57, and 64, "the total connectivity metric of a route of the plurality of routes comprises identifying a maximum connectivity metric of the plurality of links defining the route." Thus, according to Claims 42, 57, and 64, the total connectivity metric of a route comprises a maximum connectivity metric of a link of the plurality of links defining the route and not a sum of the connectivity metric of the links defining the route as stated by the Examiner and described in Cain 1. Neither Cain 1 nor Cain 2 provide any such teaching.

Therefore, Applicant respectfully submits that Cain 1 and Cain 2, alone and in combination, fail to teach, suggest, or disclose all of the elements of Claims 42, 57, and 64. As a result, Applicant respectfully requests withdrawal of the rejection of Claims 42, 57, and 64 for this additional reason.

III. Rejection of Claims 39, 54, and 61 under 35 U.S.C. § 103(a)

In section 5 of the Final Office Action, Claims 39, 54, and 61 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Cain 1 in view of U.S. Patent Publication No. 2003/0202468 to Kuhl *et al.* (Kuhl). Applicant respectfully submits that the Examiner admits that Cain 1 fails to teach all of the elements of 36, 51, and 59, from which Claims 39, 54, and 61 depend. (*See* pg. 4 of the Final Office Action). Therefore, a prima facie case of obviousness has not been established. Applicant further respectfully disagrees because Cain 1 and Kuhl, alone and in combination, fail to teach, suggest, or disclose all of the elements of

at least independent Claims 36, 51, and 59, from which Claims 39, 54, and 61 depend, respectively.

For at least the reasons discussed in Section II. above, Applicant respectfully submits that Cain 1 fails to teach, suggest, or describe all of the elements of Claims 36, 51, and 59. Kuhl describes a "[m]ethod of prioritising the usage of slotted links by single network devices in a wireless network for adapting to varying traffic loads." (Abstract). Kuhl states:

> Advantageously, a first level of priority distinguishes between master and slave. A binary version of the master/slave concept may be sufficient for substantially linear network structures in which for example the main transmission direction may be inverted globally. In flexible network topologies with interconnection in which a single network device can be connected to more than one master, a binary master/slave concept is insufficient. In interconnected network structures a graduated master/slave concept can be applied, in which a slave can refuse an order from a master, if he is occupied with an order from another higher-ranking master. ....

Relative to the priority, Kuhl states that "there is provided a method of prioritising the usage of slotted links by single network devices in a wireless network for adapting to varying traffic loads." (Para. [0010]). Thus, Kuhl describes prioritizing usage of slotted links. In addition, Kuhl teaches the ability to distinguish "between master and slave." (Para. [0013]). However, Kuhl fails to teach, suggest or describe anything related to "selecting a route for communicating information in a communication network." Prioritizing slot usage is not related to selecting a route used to communicate information, but merely to determining a time window in which a device is permitted to communicate.

Therefore, Kuhl fails to describe any calculation of a connectivity metric whatsoever. Further, Kuhl fails to teach, suggest, or describe "calculating a connectivity metric for a plurality of links defining each of a plurality of routes that connect a start node with an end node, ... determined based on the first type of node and the second type of node" as recited in Claims 36, 51, and 59. Thus, neither Cain 1 nor Kuhl teach, suggest, or describe "calculating a connectivity metric for a plurality of links defining each of a plurality of routes that connect a start node with an end node, ... determined based on the first type of node and the second

type of node" as recited in Claims 36, 51, and 59. Therefore, Applicant respectfully requests withdrawal of the rejection of Claims 39, 54, and 61, which depend from Claims 36, 51, and 59, respectively.

IV. Rejection of Claim 50 under 35 U.S.C. § 103(a)

In section 6 of the Final Office Action, Claim 50 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Cain 1 in view of U.S. Publication No. 2005/0226265 to Takatori (Takatori). Applicant respectfully submits that the Examiner admits that Cain 1 fails to teach all of the elements of Claim 36 from which Claim 50 depends. (*See* pg. 4 of the Final Office Action). Therefore, a prima facie case of obviousness has not been established. Applicant further respectfully disagrees because Cain 1 and Takatori, alone and in combination, fail to teach, suggest, or disclose all of the elements of Claim 36 from which Claim 50 depends.

For at least the reasons discussed in Section II. above, Applicant respectfully submits that Cain 1 fails to teach, suggest, or describe all of the elements of Claim 36. Takatori states:

> According to the first mode of the present invention, the inter-ring connection device can determine a transfer route by judging which ring, the physical ring or the virtual ring, the data to be transferred across between the rings is transferred within. Moreover, when determining this transfer route, it is possible to determine the transfer route taking account of the hop count up to the transfer destination, the total sum of the cost values up to the transfer destination and the congested state of the station existing on the transfer route.

(Para. [0027]). Takatori, however, fails to teach, suggest, or describe "calculating a connectivity metric for a plurality of links defining each of a plurality of routes that connect a start node with an end node, ... determined based on the first type of node and the second type of node" as recited in Claim 36. Thus, neither Cain 1 nor Takatori teach, suggest, or describe "calculating a connectivity metric for a plurality of links defining each of a plurality of routes that connect a start node with an end node, ... determined based on the first type of

node and the second type of node" as recited in Claim 36. As a result, Applicant respectfully requests withdrawal of the rejection of Claim 50 which depends from Claim 36.

Applicant believes that the present application is in condition for allowance. Favorable reconsideration of the application is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date February 6, 2009

By _____

FOLEY & LARDNER LLP
Customer Number: 23524
Telephone: (608) 258-4263
Facsimile: (608) 258-4258

Callie M. Bell
Attorney for Applicant
Registration No. 54,989